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E7.4-10562

CR-138637

ERT Doc. P-412-8

June 1974

STUDY TO DEVELOP IMPROVED SPACECRAFT SNOW
SURVEY METHODS USING SKYLAB/EREP DATA

(EREP Investigation No. 420)

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Fifth Quarterly Progress Report
Covering the Period 15 March to 15 June 1974

Contract No. NAS 9-13305

Prepared for:

Principal Investigations Management Office
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas 77958

Technical Monitor: Larry B. York Code TF6

N74-27773

Unclas
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SKYLAB/EREP DATA Quarterly Progress
Report, 15 (Environmental Research and
Technology, Inc.)

Purpose of Investigation

The purpose of this investigation is to compare and evaluate Skylab data for mapping of snow cover. Visual interpretation of the S190 photographs will be performed to map areas that are snow-covered. The S192 imagery and digital printouts, S193 data, and S194 data will then be compared to the S190 photographs to determine how much additional information on areal extent of snow can be obtained from various spectral bands, thermal data, and microwave data. Snow-depth and area measurements taken routinely by various Government agencies in the Sierra Nevada, Cascades, and Great Plains shall provide ground truth. The relatively high-resolution EREP data will be compared with television and radiometric measurements from other satellites, and available aircraft imagery, to determine the optimum future system for mapping the areal extent of snow. The results of this investigation will enable a more accurate assessment of the extent of snow cover in the United States and aid in prediction of runoff and better management of the country's water resources.

Accomplishments During Reporting Period

During this reporting period, the effort was concentrated on the preparation of an interim report to demonstrate the utility of the S190A and S190B photography and the S192 imagery for mapping areal extent of snow cover in the western United States test site areas. The report was prepared in accordance with the addendum to the subject contract, dated 25 May 1974. A proposal for the cost impact of the addendum has been submitted to the contracting office.

A draft of the report with original photographs for all illustrations, together with a duplicate set of transparencies suitable for use as view-graphs, was shipped to NASA/JSC on 14 June. Verbal authorization to proceed with the printing of the report was received from the Technical Monitor on 20 June. Printing is currently in progress, and 12 copies of the printed report will be submitted.

Travel Summary

No travel occurred during this reporting period.

Plans for the Next Reporting Period

It is anticipated that the S190A and B products from the SL-4 mission will become available during the next reporting period. When these photographs are received, they will be analyzed using the techniques described in the interim report. It will then be possible to compare the wintertime snow pattern with the patterns from the late spring of the previous year during the SL-2 mission.

Further analysis will be carried out using the S192 screening film from the SL-4 mission. The snow extent visible in the various spectral bands will be carefully mapped to determine more precisely the magnitude of the band-to-band variations. Although it is recognized that the SL-4 screening film is of relatively poor quality, it is hoped that the film will be of some use for comparing the reflectance variations during winter with those observed in the film from the SL-2 mission; such a comparison might provide an indication of the effects of different snow conditions on the observed reflectance, since the winter snow would presumably be cold and dry; whereas the late spring snow would be in a melting condition.

Further processing of the taped data products is not planned for the near future, because of our understanding that much of the early data contains errors and our experience with the one S192 tape that we have worked with. Personnel from ERT will be attending the P. I. Data Meeting scheduled to be held at NASA/JSC in mid-July. We do not plan to process any tapes until after this meeting.

Summary Outlook

Based on the information received to date, it appears that a considerable amount of useful data were collected during the latter part of the SL-4 mission. We believe that these data, together with that from the earlier SL-2 mission, will form a total sample sufficient to enable the objectives of the study to be met successfully.

Financial Report

In accordance with Appendix A of the Work Statement of the subject contract, the Financial Management Report is being submitted as a separate document.

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Discussion of Significant Results

The significant results are reported in the interim report, "Study to Develop Improved Spacecraft Snow Survey Methods Using Skylab/EREP Data: Demonstration of the Utility of the S190 and S192 Data." This report was prepared and submitted to NASA/JSC during this reporting period.